REMARKS

Claims 1-20 are all the claims pending in the application.

Claims 1-4, 6, and 11-20 are rejected under 35 U.S.C. § 102(e) as being anticipated by Nagano et al. (US 5,963,107). Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagano et al. in view of Aoki (US 6,011,533). Claims 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagano et al. in view of Woodworth (US 6,137,577). Applicant respectfully traverses the claim rejections as set forth below.

Nagano et al. relates to a pulse-width modulation signal generator preferably used for controlling a light emitting device such as a laser diode in an electro-photographic image forming apparatus like a laser printer. In FIG. 1 of the reference, a pixel pulse generator 60 that receives pixel data Dp in series and produces a pulse-width modulation signal Pw in response to the pixel data Dp, includes: a pulse control signal generator 1 that receives the serial pixel data Dp and outputs, pixel by pixel, gray scale data Dg and an intra-pixel draw position control signal Sp; a fundamental clock generator 2 for generating a fundamental clock signal CLK whose frequency is set in accordance with a draw timing of each pixel by the laser diode 7; a control signal decoder 3 that includes data corresponding to input/output data, and outputs a clock selection signal Ps and a logical operation selection signal Ls in response to the gray scale data Dg and intra-pixel draw position control signal Sp; a clock signal generator 4 that receives the fundamental clock signal CLK and outputs a plurality of phase clock signals Cm each having the same period as that of the fundamental clock signal CLK and a phase different from each other; a phase clock selector 5 that receives the plurality of phase clock signals Cm and the clock selection signal Ps, and selects a pair of phase clock signals in accordance with the clock

selection signal Ps to output them as phase converted clock signals Pa and Pb; and a logical operation circuit 6 that receives the logical operation selection signal Ls and the pair of the phase clock signals Pa and Pb, carries out on the pair of the phase clock signals Pa and Pb the logical operation selected by the logical operation selection signal Ls, and supplies its result to the laser diode driver 73 as the pulse-width modulation signal Pw.

Aoki relates to an image display method and device such as an active matrix liquid crystal display device that samples stabilized pixel data within a sampling period, to display an image with no ghosting.

Woodworth relates to a method and apparatus for measuring the size of objects on a conveyor using a photodiode light curtain to measure the height of the objects together with two laser rangefinders which employ light detection cameras and pulse tachometers to measure the length and width of the objects on the conveyor.

For the rejection of claims 1-4, 6, and 11-20, Applicant submits that Nagano et al. do not teach or suggest all of the limitations of the independent claims 1, 11, and 17. In particular, Nagano et al. fail to disclose the pulse width modulating signal output device which makes a pulse of a pulse width modulating signal rise synchronously with one of a first clock signal and a processing clock signal generated by an operation device, and makes the pulse of the pulse width modulating signal fall synchronously with a remaining one of the first clock signal and the processing clock signal generated by the operation device of claim 1. The Examiner asserts that Nagano et al. teach these features of the claim at col. 1, lines 49-57. Applicant respectfully disagrees.

The cited excerpt states that a left-hand side triangular wave generated in the triangular wave generator 66 rises in synchronism with the fundamental clock signal CLK. However, this excerpt does not correspond to the claimed feature of claim 1 for a number of reasons. First, Applicant submits that the triangular wave generator 66 is not a pulse width modulating signal output device. Instead, the triangular wave generator 66 is simply a triangular wave output device. The pulse width control signal Pw is output from the comparator 67. Second, the excerpt discloses that the triangular wave rises in synchronism with fundamental clock signal CLK, but claim 1 of the present invention claims a pulse of a pulse width modulating signal rises synchronously with one of a first clock signal and a processing clock signal. Third, the cited excerpt does not teach or suggest the pulse of the pulse width modulating signal falling synchronously with a remaining one of the first clock signal and the processing clock signal. As shown in FIG. 17, the pulse width signal Pw is not made to fall in synchronism with any other signal.

The Examiner's rejection includes several other deficiencies. Of particular note, the Examiner relies on a description of the invention for certain clocking elements and relies on a description of the prior art to teach generation of timing of the pulse width signal. It is improper to combine features of different teachings in the absence of motivation to do so. In re Kramer, 18 USPQ 2d 1415, 1416 (Fed. Cir. 1991). The deficiency with regard to the prior art is discussed above. With regard to the invention disclosed in Nagano, the generation of the pulse width occurs after a logical operation of two phase shifted clocks (P_A, P_B), based on a selection L_s. Applicant submits that from this general description, it is not possible to discern whether the signal P_w rises with P_A or P_B and falls with the other clock. Rather, the pulse depends on control

signal L_S and a logical operation of P_A and P_B. The ambiguity falls to the burden of the Examiner to explain why the claimed features necessarily result in the operation of Nagano.

Moreover, the apparatus of Fig. 16 which is used to generate the signal P_W is based on a level comparison of triangular waves, and is not based on a phase detection as is the invention of Nagano.

Therefore, claim 1 and its dependent claims 2-4 and 6 are not anticipated by Nagano et al.

Furthermore, independent claims 11 and 17 and their dependent claims 12-16 and 18-20, respectively, are not anticipated by Nagano et al. for reasons analogous to those presented above for claim 1.

With respect to clams 5 and 7-10, these claims are allowable over the prior art, at least because Aoki and Woodworth fail to make up for the above-noted deficiencies of Nagano et al.

Also, Applicant submits that there is no suggestion or motivation to combine the references. Nagano et al. is directed to a pulse width modulation signal generator, but Aoki only relates to pulse width modulation tangentially. The only mention of pulse width modulation in Aoki occurs at col. 21, lines 19-20, cited by the Examiner, which states that the output of the latch circuit of Aoki is subjected to D/A conversion or pulse width modulation. In other words, the device of Aoki is unrelated to pulse width modulation, except that its data outputs could be subjected to pulse width modulation. Thus, the clock signals described in the col. 11, lines 11-13, portion of Aoki cited by the Examiner as allegedly corresponding to the clock signals of claim 5 appear to be unrelated to any pulse width modulation device. Moreover, there seems to be nothing in the references to suggest the particular combination of the teachings of Nagano et al. and Aoki described by the Examiner. Hence, claim 5 is allowable for this additional reason.

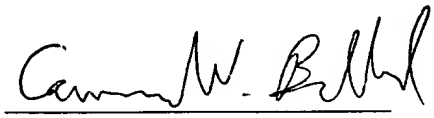
Regarding the rejection of claims 7-10, Applicant submits that there is no suggestion or motivation to combine the references. The Examiner's asserted motivation to combine the references is an assertion as to why it would be allegedly obvious to combine the general teachings of Nagano et al. of a pulse width modulation device and the general teachings of Woodworth of optical transmission. However, the Examiner has not provided a convincing line of reasoning as to why it would have been obvious to one of ordinary skill in the art to combine the particular teachings of Nagano et al. and Woodworth. Thus, the Examiner's position is not supported and should be withdrawn. Accordingly, claims 7-10 are allowable over the prior art for this additional reason.

New claims 21-24 are added to further define the invention and are believed to be allowable, at least because of their dependence from claims 1 and 7, respectively.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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